

Listing of Claims:

This listing of claims reflects all claim amendments and replaces all prior versions, and listings, of claims in the application (material to be inserted is in **bold and underline**, and material to be deleted is in ~~strikeout~~ or (if the deletion is of five or fewer consecutive characters or would be difficult to see) in double brackets [[]]. In brief, applicants have (1) canceled pending claims 1-22, and (2) added new claims 23-44.

1-22. (Canceled)

23. (New) An apparatus for stacking and unstacking a plurality of sample holders, comprising:

a first stacking station designed to hold a plurality of sample holders in a first stack; and

a singulation mechanism capable of automatically adding and subtracting sample holders to and from the first stack, the singulation mechanism including at least one latch and an electromagnet mounted near the latch, wherein the latch is biased into the first stack when the electromagnet is off, and wherein the electromagnet attracts the latch out of the first stack when the electromagnet is on.

24. (New) The apparatus of claim 23, wherein the singulation mechanism includes a plurality of latch members that are capable of receiving and releasing a sample holder to and from the first stack.

25. (New) The apparatus of claim 24, wherein the latch members are also capable of manipulating lids for the sample holders.

26. (New) The apparatus of claim 23, wherein the first stacking station is designed to hold microplates, and wherein the singulation mechanism is capable of automatically adding and subtracting the microplates to and from the first stack.

27. (New) The apparatus of claim 23, wherein the first stacking station is designed to hold biochips, and wherein the singulation mechanism is capable of automatically adding and subtracting the biochips to and from the first stack.

28. (New) The apparatus of claim 23, further comprising a transport device that moves a sample holder to and from the first stack.

29. (New) The apparatus of claim 28, further comprising a second stacking station, the first and second stacking stations being served by a single transport device so that a sample holder can be transported from one stacking station to the other stacking station.

30. (New) The apparatus of claim 28, further comprising a fluid dispensing station configured to dispense fluid to sites in a sample holder.

31. (New) An apparatus for stacking and unstacking a plurality of sample holders, comprising:

a first stacking station designed to hold a plurality of sample holders in a first stack; and

a singulation mechanism capable of automatically adding and subtracting sample holders to and from the first stack;

wherein the singulation mechanism adds a sample holder to the first stack passively, and releases a sample holder from the first stack by operating an electromagnetic switch.

32. (New) The apparatus of claim 31, wherein the singulation mechanism includes a plurality of latch members that are capable of receiving and releasing a sample holder to and from the first stack.

33. (New) The apparatus of claim 32, wherein the latch members are also capable of manipulating lids for the sample holders.

34. (New) The apparatus of claim 31, wherein the first stacking station is designed to hold microplates, and wherein the singulation mechanism is capable of automatically adding and subtracting the microplates to and from the first stack.

35. (New) The apparatus of claim 31, wherein the first stacking station is designed to hold biochips, and wherein the singulation mechanism is capable of automatically adding and subtracting the biochips to and from the first stack.

36. (New) The apparatus of claim 31, further comprising a transport device that moves a sample holder to and from the first stack.

37. (New) The apparatus of claim 36, further comprising a second stacking station, the first and second stacking stations being served by a single transport device so that a sample holder can be transported from one stacking station to the other stacking station.

38. (New) The apparatus of claim 36, further comprising a fluid dispensing station configured to dispense fluid to sites in a sample holder.

39. (New) An apparatus for processing assays, comprising:

first and second stacking stations, each stacking station configured to hold a stack of microplates, wherein at least one of the stacking stations has a bidirectional capability to release microplates from the bottom of the stack by operating an electromagnetic switch and to receive microplates at the bottom of the stack passively;

a fluid dispensing station having an array of dispense tips for depositing fluid aliquots into wells of a microplate; and

a microplate shuttle device that carries microplates between stations.

40. (New) The apparatus of claim 39, further comprising an analyzer station also served by the shuttle device so that microplates can be automatically carried between any one of the other stations and the analyzer station.

41. (New) The apparatus of claim 40, further comprising a controller that schedules and initiates singulation of microplates to and from stacking stations, transport of microplates between stations, dispensing of fluid into microplates at the fluid dispensing station, and analysis of samples at the analyzer station.

42. (New) An integrated apparatus for processing a plurality of sample holders, comprising:

an analyzer having an examination site;

an input site for receiving a sample holder;

a shuttle device for carrying a sample holder in two directions along a processing path between the input site and the examination site; and

at least one stacking unit along the processing path including a singulation mechanism capable of receiving microplates from the processing path passively and releasing the microplates to the processing path by operating an electromagnetic switch.

43. (New) The apparatus of claim 42, further comprising a second stacking unit along the processing path.

44. (New) The apparatus of claim 42, further comprising a fluid dispensing unit along the processing path.